

MARICOPA ASSOCIATION OF GOVERNMENTS

HIGH CAPACITY TRANSIT PLAN



High Capacity Transit Working Group
Steve Schibuola, IBI Group

December 2002

PROJECT MILESTONES

MILESTONE 4 – Oct 2002

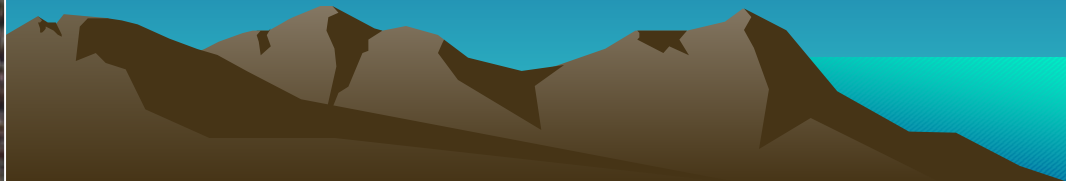
Evaluation of Alternatives

MILESTONE 5 – Dec 2002

**Regional High Capacity
Transit Plan**

**MILESTONE 6 – Dec/Jan
2003**

Final Report



KEY TASKS COMPLETED

- **Agency Interviews**
- **Evaluation of Peer Transit Systems**
- **Selected Preliminary Corridors/Technologies**
- **Initial Corridor Assessment**
- **Definition of Alternative HCT Networks**
- **Preliminary Evaluation of Corridors**
- **Cost Effectiveness Rankings**
- **Refined Costs and Ridership**
- **Specific Reappraisal of Commuter Rail**



MILESTONE 5

Recommended Network:

- **Finalize corridor evaluation**
- **Re-appraise Commuter Rail**
- **Preliminary operating characteristics**
- **Refine ridership, revenues, costs**

- **Develop implementation schedule, phasing**



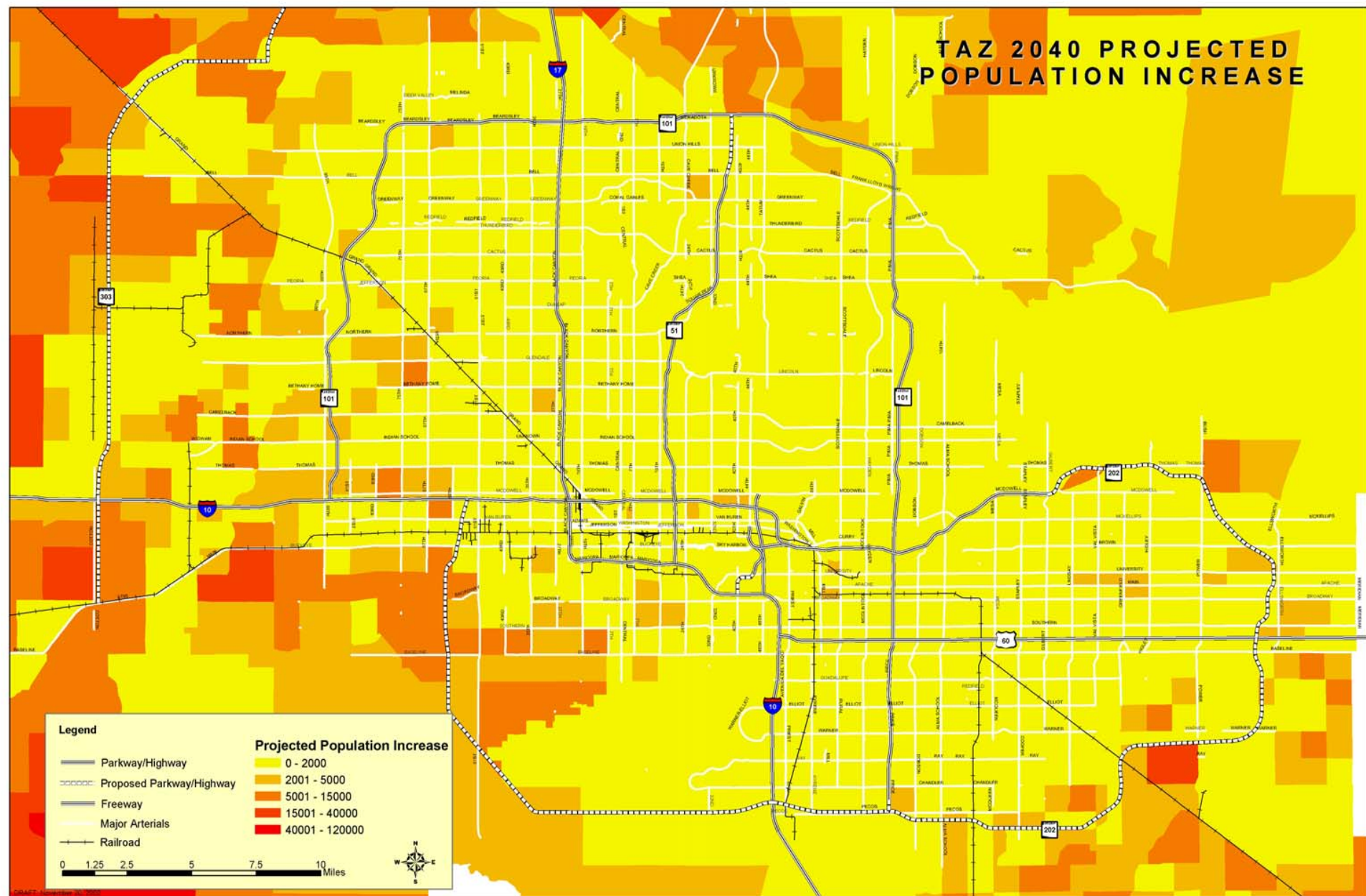
Completion: December 2002

WHAT'S NEW

- **Incorporation of DRAFT2 Forecasts**
- **Refinements to Network:**
 - Central Avenue LRT
 - Northern/Camelback Consolidation to Glendale
 - Scottsdale/Rural/UP Tempe Branch Consolidation
 - Metrocenter/I-17 (CP/EV) LRT Extension to Bell
 - UP Chandler Branch LRT/BRT
 - Additional station on BNSF at Grand/Loop 303
- **Commuter Rail Costs, Phasing, Technology & Ridership**

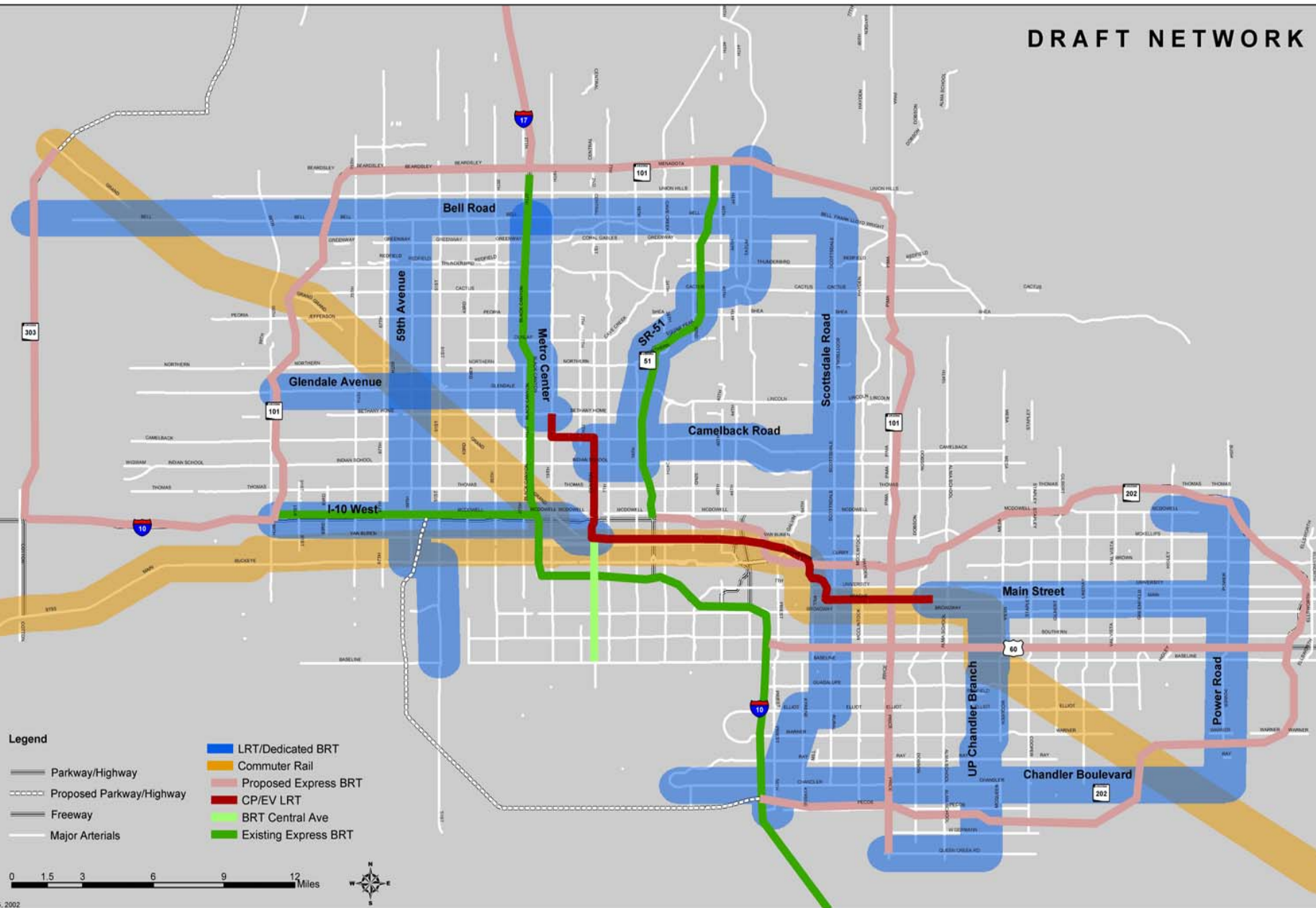


MAG REGION IS GROWING



DRAFT FINAL NETWORK

DRAFT NETWORK



Legend

- Parkway/Highway
- - - Proposed Parkway/Highway
- Freeway
- Major Arterials

- LRT/Dedicated BRT
- Commuter Rail
- Proposed Express BRT
- CP/EV LRT
- BRT Central Ave
- Existing Express BRT

0 1.5 3 6 9 12 Miles



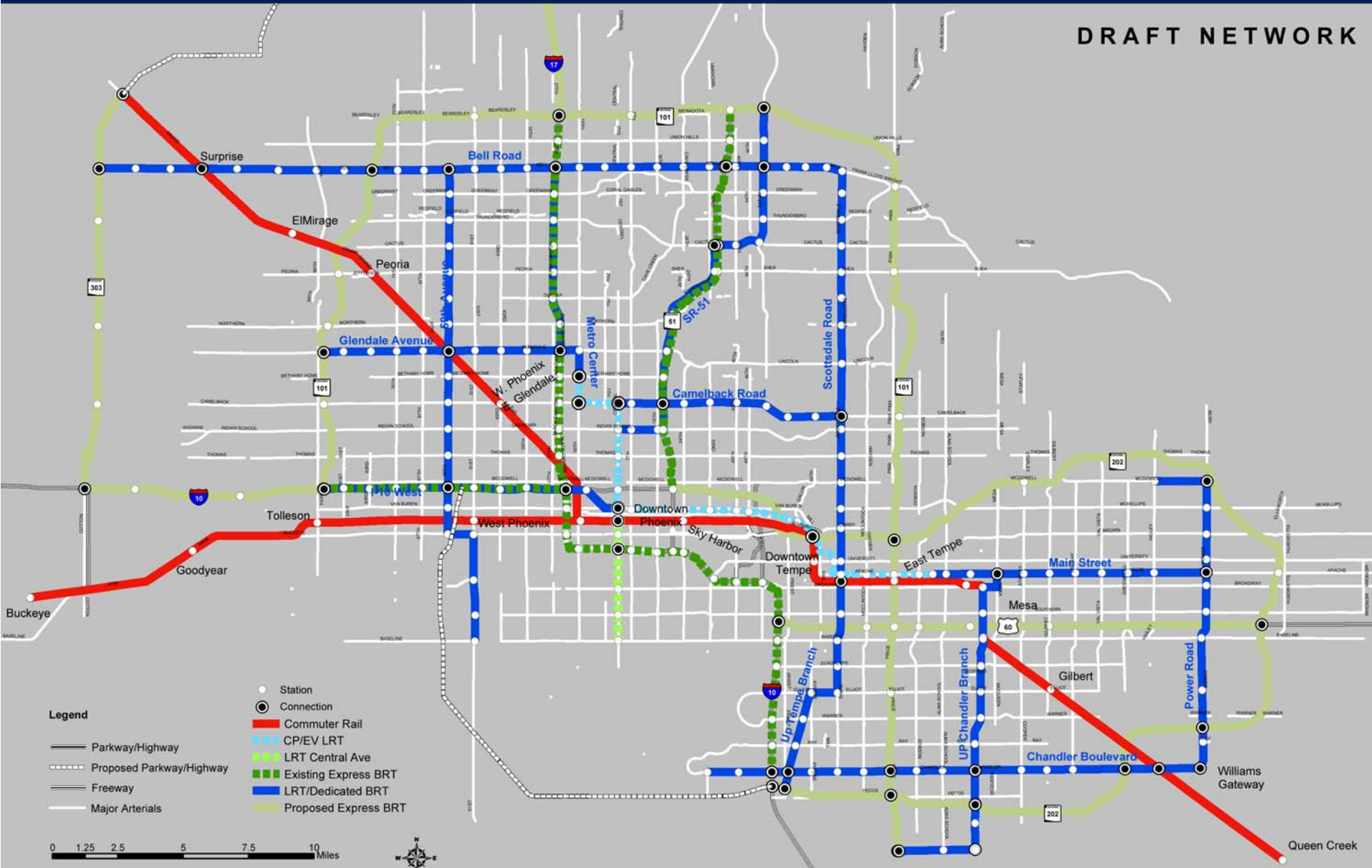
COMMUTER RAIL: REFINEMENTS

- Refined strategies to reduce cost/infrastructure
- New technologies – Diesel Multiple Unit (DMU) have promise (U.S. and European products)
- Some reverse commute, more stations beneficial
- Ridership improves primarily through new DRAFT2 forecasts



NETWORK CONNECTIONS

DRAFT NETWORK



COMMUTER RAIL: REFINEMENTS

Data Input	MS 4 Assumption	MS 5 Assumption
Population Projections	Interim projections 6.4 million residents	Updated projection 7.4 million residents
Stations	BNSF 6 stations	BNSF 7 stations, other corridors same
Station Catchments	3 mile primary (to 5 miles secondary)	3 mile primary (to 10 miles secondary)
Costs	No change from revised version in MS 4 report	Adjustments to vehicles and parking for new riders
Commute	No reverse commute	Reverse commute assumed on all corridors

COMMUTER RAIL: BOARDINGS

DRAFT NETWORK: COMMUTER RAIL STATION BOARDINGS

Legend

- Freeway
- Proposed Freeway/Parkway/
Highway
- Major Arterials

- UP Yuma
- UP Southeast
- BNSF
- Commuter Rail

0 1.25 2.5 5 7.5 10 Miles



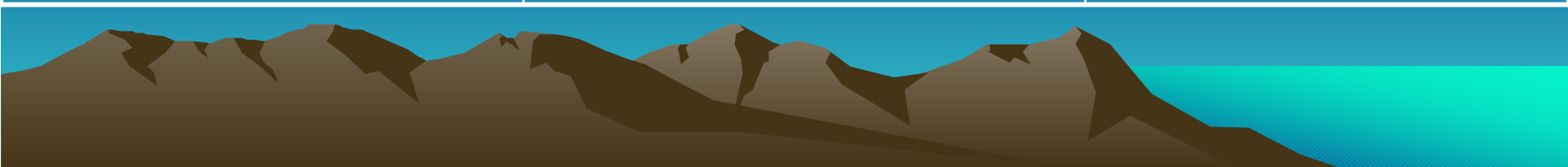
COMMUTER RAIL: PHASING

- **Phase 1 Service**
 - 3 Peak Period Trains, inbound am, outbound pm
- **Phase 3 Service**
 - 15 minute peak service inbound direction
 - 30 minute peak service outbound direction
 - Off-peak service (30 to 60 min frequency)
 - Reverse commute
- **Intermediate phasing will vary by corridor, ridership, funding availability**



COMMUTER RAIL: PHASING

Corridor & Phase	Total Capital Cost (\$ millions)	Total Ridership
BNSF PH 1	\$353.48	6,391
BNSF PH 3	\$741.64	16,145
UP Southeast PH 1	\$282.88	2,235
UP Southeast PH 3	\$608.84	6,471
UP Yuma PH 1	\$190.28	4,722
UP Yuma PH 3	\$471.67	12,034



COMMUTER RAIL - RECOMMENDATIONS

- DMU-based advantages:
 - U.S. product – Colorado Railcar
 - FRA certification
 - Several configurations
 - Aero with bi-levels
 - Startup simplicity
 - European product- Bombardier Talent
 - Canada but not FRA certified
 - Widely used in Europe



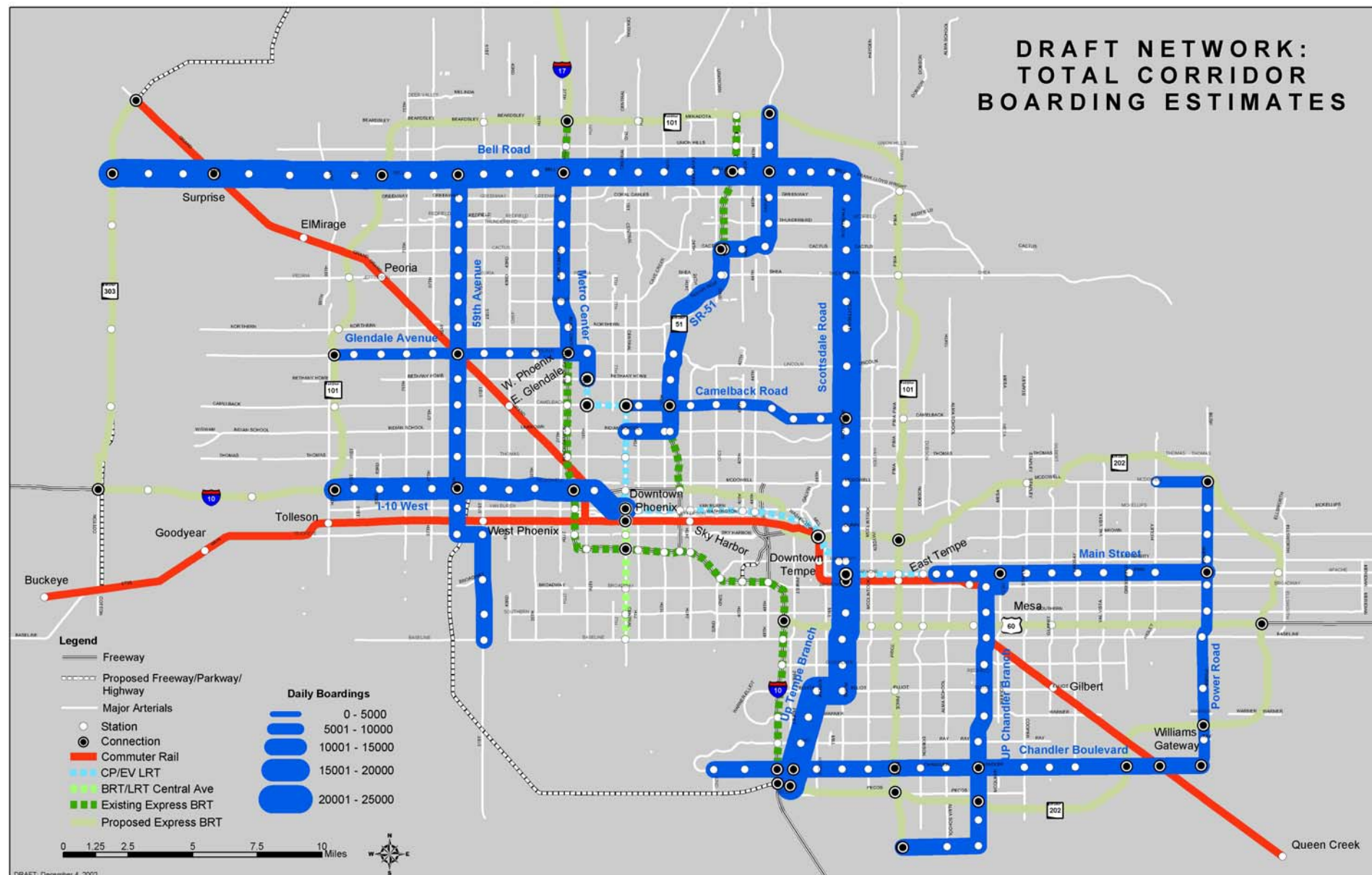
LRT/BRT: REFINEMENTS

- **Adjusted station spacing to be consistent with CP/EV MOS**
- **I-10 West costs now assume an at-grade system in median**
- **Ridership forecasts revised to reflect DRAFT2 forecasts**

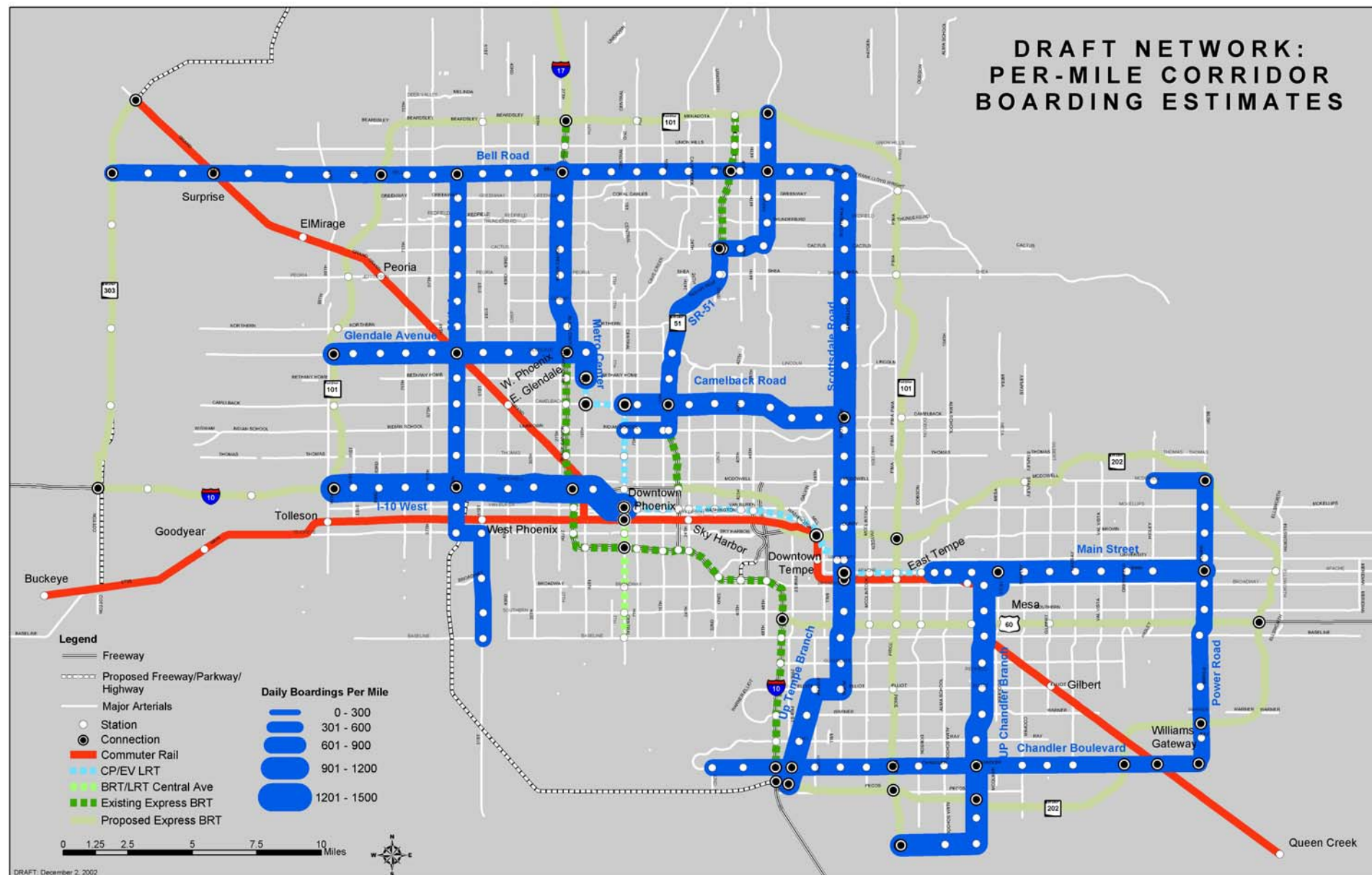


LRT/BRT: RIDERSHIP OVERVIEW

DRAFT NETWORK:
TOTAL CORRIDOR
BOARDING ESTIMATES



LRT/BRT: RIDERSHIP DENSITY



NETWORK: HEADWAYS OVERVIEW

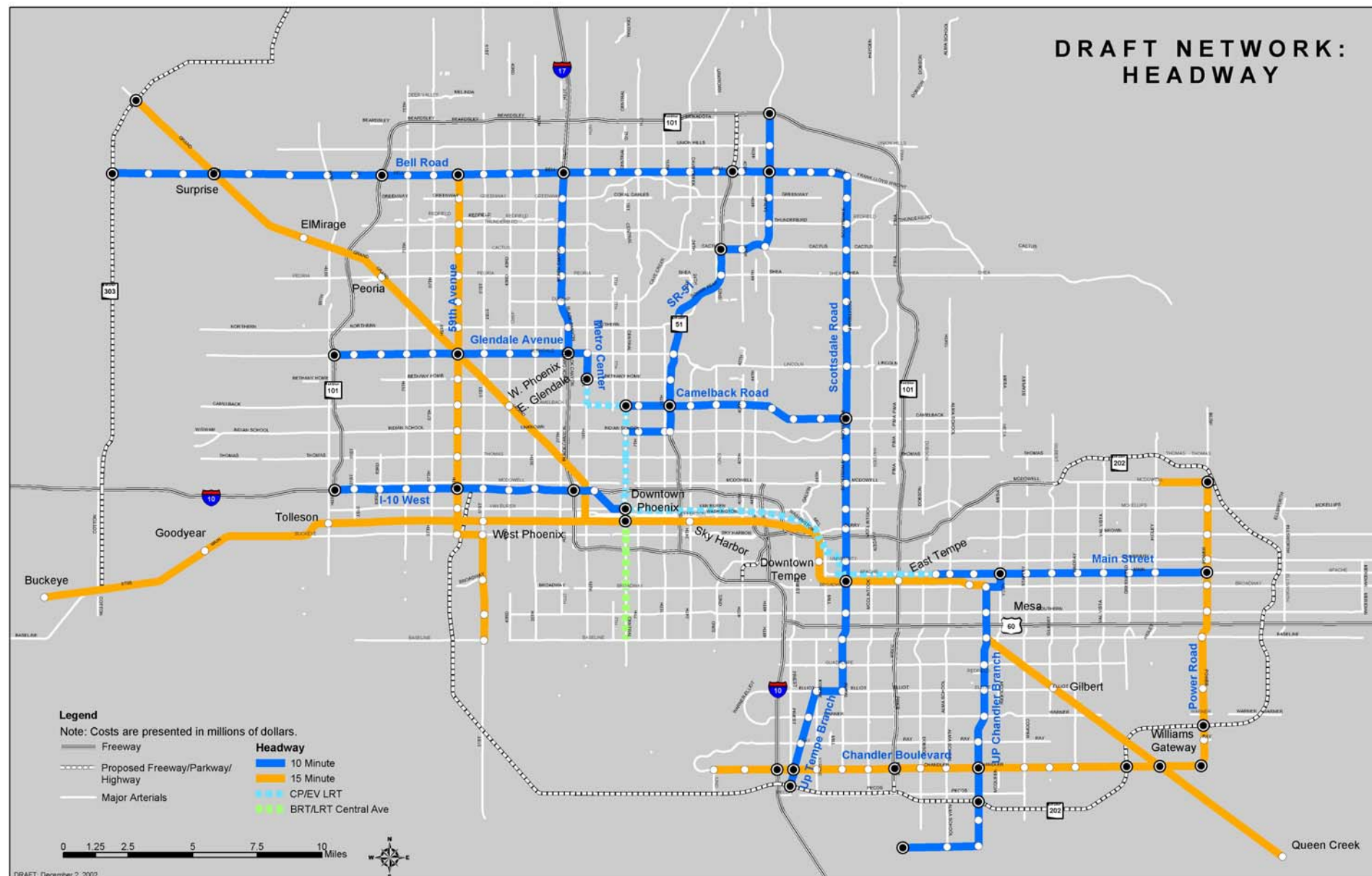
DRAFT NETWORK: HEADWAY

Legend

Note: Costs are presented in millions of dollars.

- Freeway
 - Proposed Freeway/Parkway/
Highway
 - Major Arterials
- Headway**
- 10 Minute
 - 15 Minute
 - CP/EV LRT
 - BRT/LRT Central Ave

0 1.25 2.5 5 7.5 10 Miles



REVISED COST EFFECTIVENESS

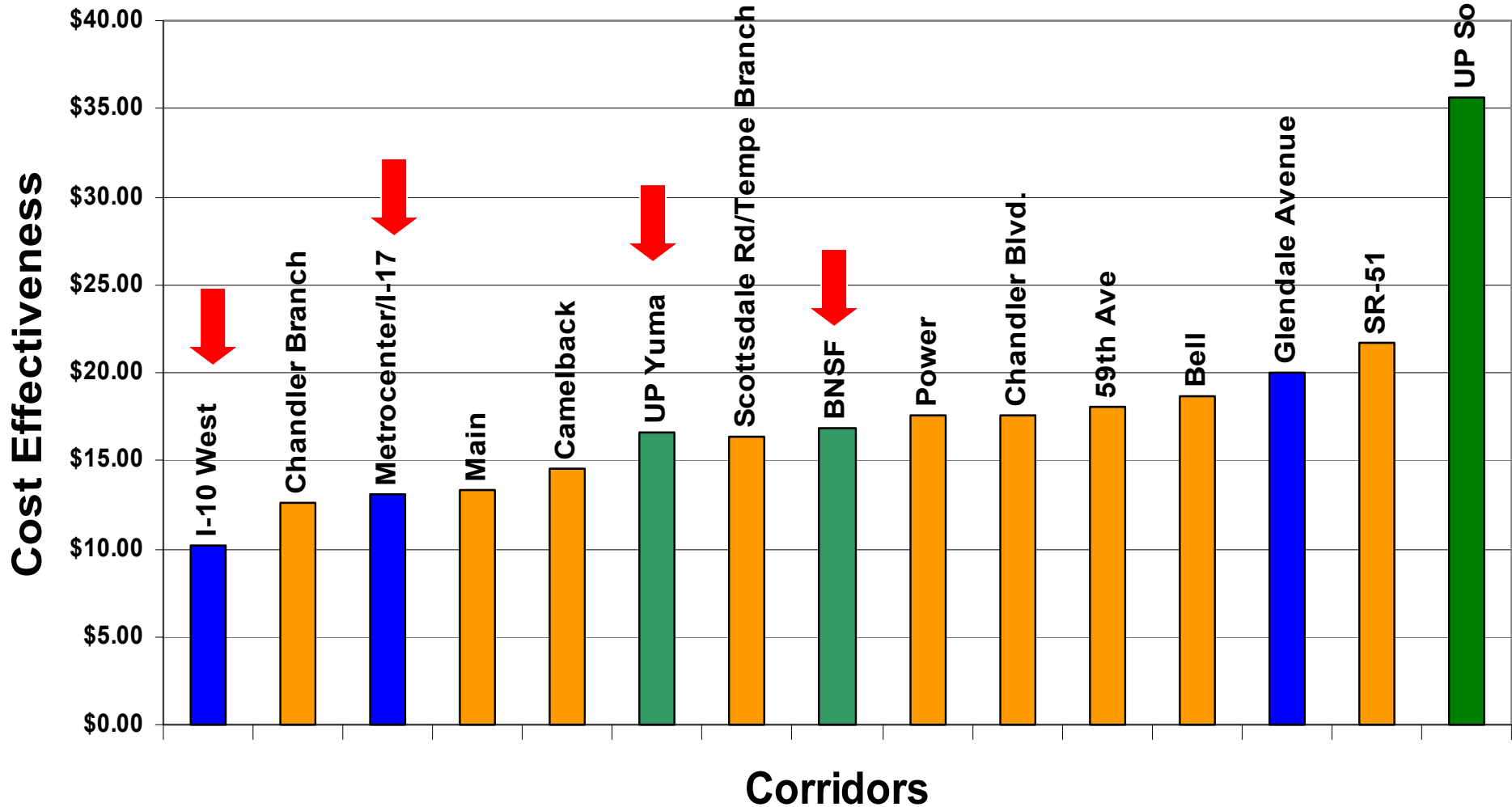


Major Improvements

LRT/Dedicated BRT

LRT

Commuter Rail



GROWTH and PHASING

- **Rates of Growth highest in West Valley**
 - But major demand deferred to 2040?
 - Phoenix and East Valley demand sooner
- **Corridor connectivity and early growth**
 - N-S corridors, Phoenix LRT and BRT



GROWTH TIMING

POPULATIONS BY CITY AND PROJECTIONS

Surprise
2000 Pop. 37746
2010 Pop. 119365
2020 Pop. 210629
2030 Pop. 345510
2040 Pop. 644386

Glendale
2000 Pop. 230286
2010 Pop. 294885
2020 Pop. 308854
2030 Pop. 311693
2040 Pop. 313430

Buckeye
2000 Pop. 16663
2010 Pop. 76555
2020 Pop. 166934
2030 Pop. 489413
2040 Pop. 586782

Goodyear
2000 Pop. 21246
2010 Pop. 66586
2020 Pop. 162623
2030 Pop. 334552
2040 Pop. 366203

Avondale
2000 Pop. 37827
2010 Pop. 71086
2020 Pop. 103457
2030 Pop. 114374
2040 Pop. 114840

Tolleson
2000 Pop. 4998
2010 Pop. 6229
2020 Pop. 6314
2030 Pop. 6338
2040 Pop. 6355

Litchfield Park
2000 Pop. 3831
2010 Pop. 8759
2020 Pop. 14095
2030 Pop. 14573
2040 Pop. 14807

Youngtown
2000 Pop. 3013
2010 Pop. 5585
2020 Pop. 6395
2030 Pop. 7170
2040 Pop. 7344

El Mirage
2000 Pop. 8723
2010 Pop. 34711
2020 Pop. 44696
2030 Pop. 51186
2040 Pop. 51364

Peoria
2000 Pop. 114143
2010 Pop. 165578
2020 Pop. 250393
2030 Pop. 349641
2040 Pop. 383513

Phoenix
2000 Pop. 1350472
2010 Pop. 1700757
2020 Pop. 2014101
2030 Pop. 2172893
2040 Pop. 2261117

Paradise Valley
2000 Pop. 14071
2010 Pop. 15247
2020 Pop. 15831
2030 Pop. 16005
2040 Pop. 16170

Guadalupe
2000 Pop. 522
2010 Pop. 5228
2020 Pop. 5229
2030 Pop. 5230
2040 Pop. 5305

GRIC
2000 Pop. 2699
2010 Pop. 3219
2020 Pop. 4224
2030 Pop. 5202
2040 Pop. 9479

Scottsdale
2000 Pop. 204317
2010 Pop. 261459
2020 Pop. 294593
2030 Pop. 300416
2040 Pop. 301621

SRPMIC
2000 Pop. 6451
2010 Pop. 7410
2020 Pop. 7486
2030 Pop. 7510
2040 Pop. 7529

Tempe
2000 Pop. 158865
2010 Pop. 175540
2020 Pop. 182121
2030 Pop. 184159
2040 Pop. 187227

Chandler
2000 Pop. 185309
2010 Pop. 260400
2020 Pop. 285266
2030 Pop. 287878
2040 Pop. 289944

Fountain Hills
2000 Pop. 20497
2010 Pop. 24836
2020 Pop. 30862
2030 Pop. 31229
2040 Pop. 31527

Mesa
2000 Pop. 441846
2010 Pop. 535188
2020 Pop. 617934
2030 Pop. 646222
2040 Pop. 649011

Gilbert
2000 Pop. 119159
2010 Pop. 179939
2020 Pop. 276790
2030 Pop. 287296
2040 Pop. 287760

Maricopa County
2000 Pop. 85282
2010 Pop. 91681
2020 Pop. 118517
2030 Pop. 180544
2040 Pop. 615477

Queen Creek
2000 Pop. 8947
2010 Pop. 19358
2020 Pop. 75624
2030 Pop. 93527
2040 Pop. 93606

Legend

- Freeway
- Proposed Parkway/Highway
- Major Arterials
- Railroad

- Total Population in 2000
- Estimated Population in 2010
- Total Population in 2020
- Total Population in 2030
- Total Population in 2040

0 1.25 2.5 5 7.5 10 Miles



PHASING OVERVIEW

- **Potential Early Corridors**
 - Scottsdale/Rural/UP Tempe, Main St Mesa, I-10 West, Metrocenter, Glendale, SR-51, Camelback, UP Chandler, Commuter Rail startup
- **Potential Later Corridors**
 - Chandler Blvd, Bell, 59th, Power Road, Commuter Rail full



CONCLUSIONS

- **Arterial-based LRT/BRT Network at the core**
 - It's where the demand is located
 - Densities drive the grid-based network
 - Most corridor demand more BRT suited
 - Later growth may require LRT
- **Commuter Rail**
 - Can provide regional strategic connectivity
 - Longer-haul trips but volume contribution limited relative LRT/BRT



RECOMMENDATIONS

NEXT STEPS

- **Deeper Investigation of Key Commuter Rail Opportunities:**
 - BNSF Grand Avenue relocation package
 - More detailed ridership, revenue and cost appraisal of UP Yuma and Southeast lines
- **Corridor-Specific MIS/AA Packages for BRT/LRT Opportunities:**
 - Alignment/technology alternatives (e.g. Main St Mesa, I-10 West)
 - CP/EV Connections – Glendale, SR-51, Camelback, Metrocenter/I-17



RECOMMENDATIONS

NEXT STEPS

- **Regional Management – Regional Funding**
 - Review role & function of current operators in HCT Network
- **Partnership Opportunities**
 - Development-supported corridor investment (esp. W Valley)
 - Look beyond design & build, spread the risk – DBO/M?

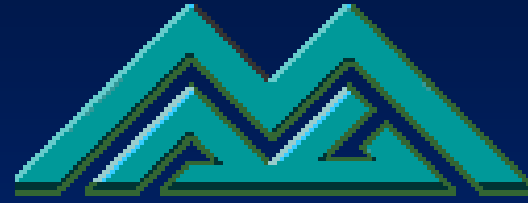


MILESTONE 6

- **Combine Working Papers**
- **Complete and incorporate MAG model run**
- **Final Report**
- **Regional Presentations**



Completion: Dec/Jan 2003



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